Bipolar Transistor

multicomp PRO

RoHS Compliant

Description:

A Silicon NPN transistor in a TO-39 case intended for high speed switching applications.

Absolute Maximum Ratings:

Collector-Base Voltage, V_{CBO}	: 75V
Collector-Emitter Voltage, V_{CEO}	: 40V
Emitter-Base Voltage, V_{EBO}	: 6V
Continuous Collector Current, I_C	: 800mA
Total Device Dissipation (T_C = +25ºC), PD	: 1.2W
Derate above 25ºC	: 6.85mW/ºC
Total Device Dissipation (T_A = + 25ºC), P_D	: 400mW
Derate above 25ºC	: 2.28mW/ºC
Operating Junction Temperature Range, T_J	: -65ºC to +200 ºC
Storage Temperature Range, T_{stg}	: -65ºC to 200ºC

Electrical Characteristics: (T_A = +25ºC Unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Max	Unit
OFF Characteristics					
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	40	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10µA, I_E = 0	75	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10µA, I_C = 0	6	-	V
Collector Cut-Off Current	I_{CBO}	V_{CE} = 60V, I_E = 0	-	0.01	µA
		V_{CE} = 60V, I_E = 0, T_A = +150ºC	-	10	µA
	I_{CEX}	V_{CE} = 60V, $V_{EB(off)}$ = 3V	-	10	µA
Emitter Cut-Off Current	I_{EBO}	V_{EB} = 3V, I_C = 0	-	10	µA
Base Cut-Off Current	I_{BL}	V_{CE} = 60V, $V_{EB(off)}$ = 0	-	20	µA
On Characteristics					
DC Curent Gain	h_{FE}	I_C = 0.1mA, V_{CE} = 10V	20	-	-
		I_C = 1mA, V_{CE} = 10V	25	-	-
		I_C = 10mA, V_{CE} = 10V	35	-	-
		I_C = 10mA, V_{CE} = 10V, T_A = -55ºC	15	-	-
		I_C = 150mA, V_{CE} = 10V (Note 1)	40	120	-
		I_C = 150mA, V_{CE} = 1V (Note 1)	20	-	-
		I_C = 500mA, V_{CE} = 10V (Note 1)	25	-	-
Collector-Emitter Saturation Voltage (Note 1)	$V_{CE(sat)}$	I_C = 150mA, I_B = 5mA	-	0.3	V
		I_C = 500mA, I_B = 50mA	-	1	V
Base-Emitter Saturation Voltage (Note 1)	$V_{BE(sat)}$	I_C = 150mA, I_B = 15mA	0.6	1.2	V
		I_C = 500mA, I_B = 50mA	-	2	V

Small-Signal Characteristics

Current Gain-Bandwidth Product (Note 2)	f_T	I_C = 20mA, V_{CE} = 20V, f = 100MHz, (Note 2)	250	-	MHz
Output Capacitance	C_{obo}	V_{CB} = 10V, I_E = 0, f = 100kHz	-	8	pF
Input Capacitance	C_{ibo}	V_{EB} = 0.5V, I_C = 0, f = 10kHz	-	25	pF
Input Impedance	h_{ie}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	1	3.5	kΩ
		I_C = 10mA, V_{CE} = 10V, f = 1kHz	0.2	1	kΩ
Voltage Feedback Ratio	H_{re}	I_C = 1mA, V_{CE} = 10V, f = 1kHz		5	$\times10^{-4}$
		I_C = 10mA, V_{CE} = 10V, f = 1kHz	-	2.5	$\times10^{-4}$
Output Admittance	h_{oe}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	3	15	µmhos
		I_C = 10mA, V_{CE} = 10V, f = 1kHz	10	100	µmhos
Collector-Base Time Constant	rb′C_C	I_C = 20mA, V_{CB} = 20V, f = 31.8MHz	5	150	ps
Noise Figure	NF	I_C = 100µA, V_{CE} = 10V, R_S = 1kΩ, f = 1kMHz	-	4	dB
Real Part of Common-Emitter High Frequency input Impedance	Re(h_{ie})	I_C = 20mA, V_{CE} = 20V, f = 300MHz	-	60	Ω

Switching Characteristics

Delay Time	t_q	V_{CC} = 30V, I_C = 150mA, $V_{CE(OFF)}$ = 0.5V, I_{B1} = 15mA	-	10	ns
Rise Time	t_r		-	25	ns
Storage Time	t_s	V_{CC} = 30V, I_C = 150mA, I_{B1} = I_{B2} = 15mA	-	225	ns
Fall Time	t_f		-	60	ns
Active Region Time Constant	T_A	I_C = 150mA, V_{CE} = 30V	-	2.5	ns

Notes

1. Pulse Test: Pulse Width ≦ 300s, Duty Cycle ≦ 2%.
2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

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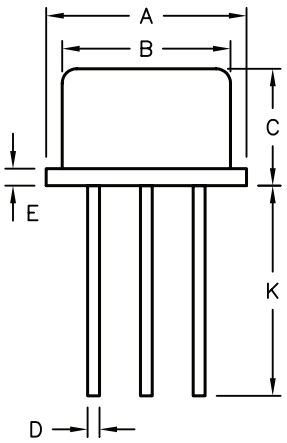
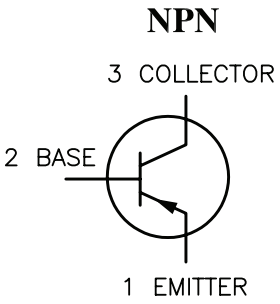
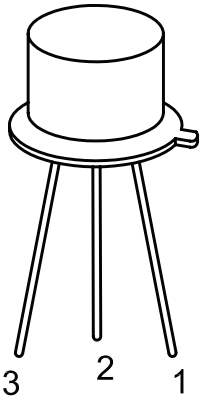
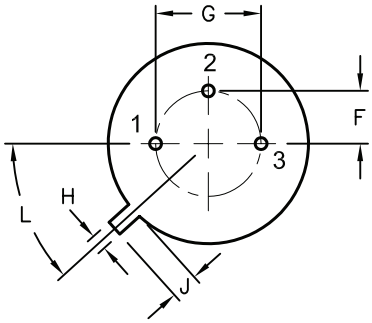




STYLE 1
PIN 1. EMITTER
2. BASE
3. COLLECTOR





Dim	Min	Max
A	8.5	9.39
B	7.74	8.5
C	6.09	6.6
D	0.4	0.53
E	-	0.88
F	2.41	2.66
G	4.82	5.33
H	0.71	0.83
J	0.73	0.86
K	12.7	-
L	42º	48º

Dimensions : Millimetres

Part Number Table

Description	Part Number
Bipolar Transistor	2N2218A